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Philip E. Batt, Governor

September 22, 1995

Ms. Lisa Green, Manager
Environmental Restoration Program
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive
Idaho Falls, ID 83401-1563

RE: Assessment of Risk from External Exposure to Radiation from Contamination Brought to the Surface by Biological Activity at the SL-1 and BORAX-I Sites

Dear Ms. Green:

The Idaho Department of Health and Welfare, Division of Environmental Quality (IDHW/DEQ) is in receipt of your September 15, 1995 letter by which a draft document prepared by the Environmental Research and Science Foundation (ERSF) was transmitted for Agency review. This draft document pertained to the evaluation of external exposure risk posed by radionuclide contamination brought to the surface by various biointruders at the SL-1 and BORAX-I sites.

We have expressed concern on several occasions that the evaluation was based upon a number of assumptions that are at the very least debatable if not incorrect. In addition, there is uncertainty in the source term concentration, in particular, for SL-1 in which the total inventoried activity is two to three times the modeled source activity. The following are the primary assumptions with which we take exception:

- Density of ant mounds in native habitat (18 colonies/hectare) should be 90 colonies/hectare based upon site-specific information available for BORAX-I.

- Contaminants brought to the surface over the SL-1 trench and pits source area (16,562 ft2) were spread over the entire 180,000 ft2 burial ground exclusion area thereby "diluting" the resultant concentration. (This is in contrast to the reasonable assumption for BORAX-I in which the contaminants brought to the surface over the 10,000 ft2 source area were spread over only that 10,000 ft2 area.)

- Contamination brought to the surface was assumed to mix to a depth of 5 cm since ERSF's soil sampling data indicates that most radionuclides are found within this interval. Since vertical profiling was not performed to indicate where within this upper 5 cm the majority of contamination resides, it would be more conservative to mix the contamination to a depth of 1 cm instead and not to take credit for shielding.

- Biointrusion activity over the first 100 years of institutional control was apparently not factored into the evaluation. If the starting year is 1994, then the time of interest should be 1994 + 100 yrs + 30 yrs which equates to the year 2124, not the year 2024 as indicated throughout the evaluation.

- The dose reduction factor of 0.5 to account for shielding in the residential scenario is not used in INEL risk assessments.

- BORAX-I source area/volume did not account for 74,000 ft2 area of radionuclide-contaminated surface soils that may require consolidation under the cover.

- The maximum burrow depth used in the evaluation for the vole (0.55 vs. 1.55 m), ground squirrel (1.40 vs. 2.00 m) and pocket mouse (1.83 vs. 1.93 m) are different from those values reported in the literature.

Despite our concern with the assumptions in the evaluation performed by the ERSF, the conclusion reached by the ERSF is that the total 30 year risks from SL-1 and BORAX-I due to biological activity are "roughly equivalent at about 10^{-4}". In addition, the preliminary biorisk calculations performed by IDHW/DEQ within the past two months support the same conclusion. Therefore, it is our conclusion that an unacceptable risk is posed by biointruders (ants, small mammals and plants) and that a composite biointrusion layer is warranted for both SL-1 and BORAX-I to mitigate the risks posed by these biointruders.

Finally, we request that the draft ERSF evaluation not be further refined and placed in the administrative record for the following reasons: (1) the draft document is not acceptable to IDHW/DEQ and will not be without significant revision as related to the assumptions described above; (2) the conclusion that risk was estimated in the 10^{-4} range, despite the debatable assumptions,, will not change; and, (3) expenditure of additional funds to finalize the draft evaluation appears unnecessary given the conclusion reached in the draft evaluation.

Should you have any questions regarding this letter, please contact me at your earliest convenience. My telephone number is (208) 373-0260.

Sincerely,

E. Jean Underwood

E. Jean Underwood
WAG 5 Manager
Remediation Bureau

EJU/jc biorisk.ltr

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